4.0 Problem Definition/Background

A. It is the policy of the DEQ to provide sufficient quality control and quality assurance to assure that data of known and acceptable comparability, precision and accuracy, representativeness, and completeness are collected in all monitoring projects.

Completeness of the data is related to the sampling frequency and the percent of data passing acceptability criteria (valid samples). Completeness is achieved by selecting the proper sampling frequency, providing adequate training, and adhering to instrument calibration, monitoring, and maintenance protocols.

Comparability tests the consistency of units and collection and analysis methods utilized by the various reporting agencies in Montana. The ultimate goal is direct comparison and improved correlation among data submitted to the DEQ.

Representativeness refers to the nature of the conditions affecting sampling methods and the particular parameter being measured. The goal is to locate and eliminate or minimize bias, so the data collected shows the true conditions of the area being sampled. This includes consideration of siting criteria, spatial scales, monitoring objectives, climatic change, source configuration, and duration of study.

Precision defines the ability of personnel and equipment to obtain repeatable results for identical samples or conditions.

Accuracy reflects how close the measured data points are to what is actually presented to the instruments.

B. Obtaining representative samples and maintaining their integrity are critical parts of any monitoring or enforcement program. Analytical methods have been standardized but the results of analyses are only as good as the sampling and the sample preservation methods. Each step in a water quality investigation must be examined to ensure that the end results will be meaningful, representative of the sampling source and of known precision. Location of sampling points, collection and preservation of samples, field analytical techniques, measurement of water flows, processing of data and interpretation of results are all important steps in a water quality study.

This manual summarizes field procedures commonly used for in programs of the Department of Environmental Quality : Drinking Water, Groundwater Monitoring, Intensive Surveys, MPDES Compliance Monitoring, and Clark Fork Basin Study. It is meant to describe "Standard Operating Procedures" common to all programs, as well as documenting procedures more specific to one or another program. It is not meant to be a compilation of all field procedures or the best existing methods for conducting water quality investigations.

This manual draws heavily from U.S. Environmental Protection Agency and U.S. Geological Survey guidance on the collection and preservation of water quality samples. Often, this guidance has been modified and adapted to suit the particular needs of the Department of Environmental Quality.

In some instances, little guidance is available for certain field procedures. However, techniques and described procedures herein are selected to maximize accuracy, simplicity, comparability of results with other agencies and organizations, and continuity over time given inevitable changes in personnel.